

HM Pro2300 - High-throughput Targeted Metabolomics Panel

Service Description

We provide one of the most comprehensive panels for targeted metabolomics research. The HM Pro2300 panel uses LC-MS/MS technology for high-throughput targeted metabolomics detection. HM Pro2300 can simultaneously detect more than 2,000 metabolites, including 700 small molecules and more than 1,600 lipids which covers all kinds of important metabolites and core metabolic pathways. We also provide HM700 and HML1600, only detecting small molecules and lipids respectively.

HM700 includes more than 400 metabolites related to intestinal flora, which applies to address key pathophysiological processes relevant in gut microbiota research and cancer research areas. Each metabolite is quantitatively determined using the standard curve. This enables greater in-depth mining of metabolome information, providing accurate quantification, excellent reproducibility and high throughput.

The HML1600 can achieve absolute quantification for more than 1,600 lipids of 12 subclasses by the method of combining standard curves with internal standard, covering all kinds of lipids with important biological functions. HML1600 is used for nervous system disease research, cardiovascular and cerebrovascular disease research, nutritional metabolism research, lipid metabolism research and other fields.

Coverage of the Metabolites

Product		Category of Metabolites	Number of Metabolites
HM Pro2300	HM700-meta	Amino acids and Peptides	~125
		Fatty acids	~110
		Organic acids and derivatives	~63
		Bile acids	~99
		Carbohydrates	~51
		Benzenoids	~69
		Carnitines or Acyl carnitines	~23
		Indoles and derivatives	~24
		Nucleosides	~19
		Organoheterocyclic	~25
		Phenylpropanoids and polyketides	~35
		Organooxygen	~10
		other	~47
	HML1600-Lipids	Glycerophospholipids	~1091
		Glycerolipids	~513
		Sterol Lipids	~26
		Sphingolipids	~70
Total		2,300+	

Technology Platforms



Waters ACQUITY UPLC



SCIEX QTRAP 5500



SCIEX QTRAP 6500+

Service Advantages



High Throughput



Reproducible



Small Sample
Volume

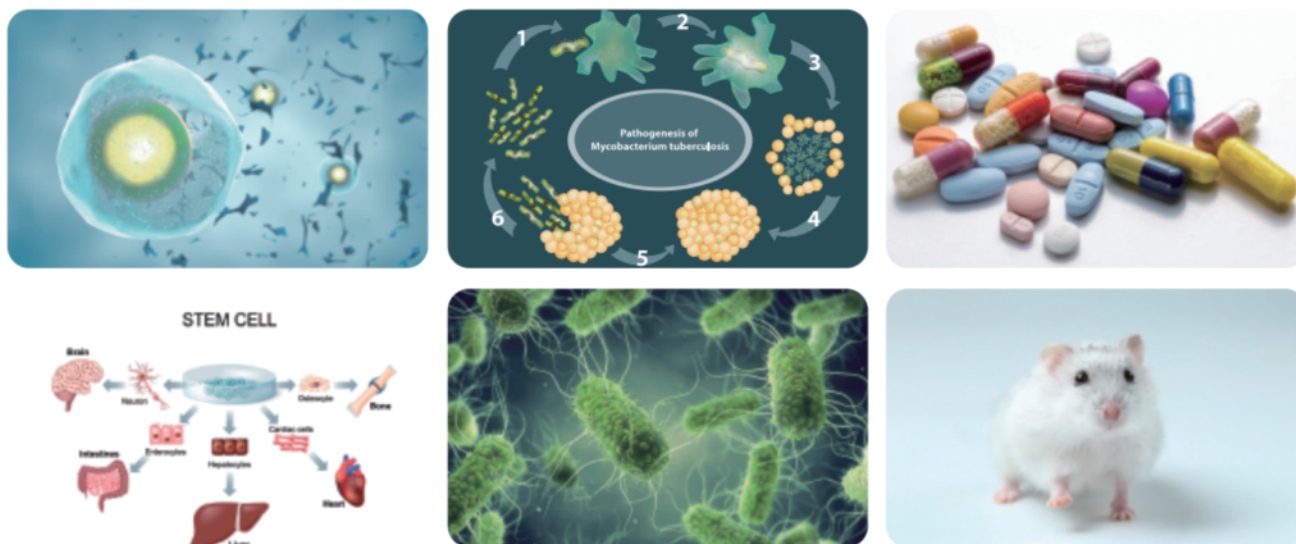


Standardized
quantitative

Unique Pathway Coverage for A Deeper Understanding of Biology

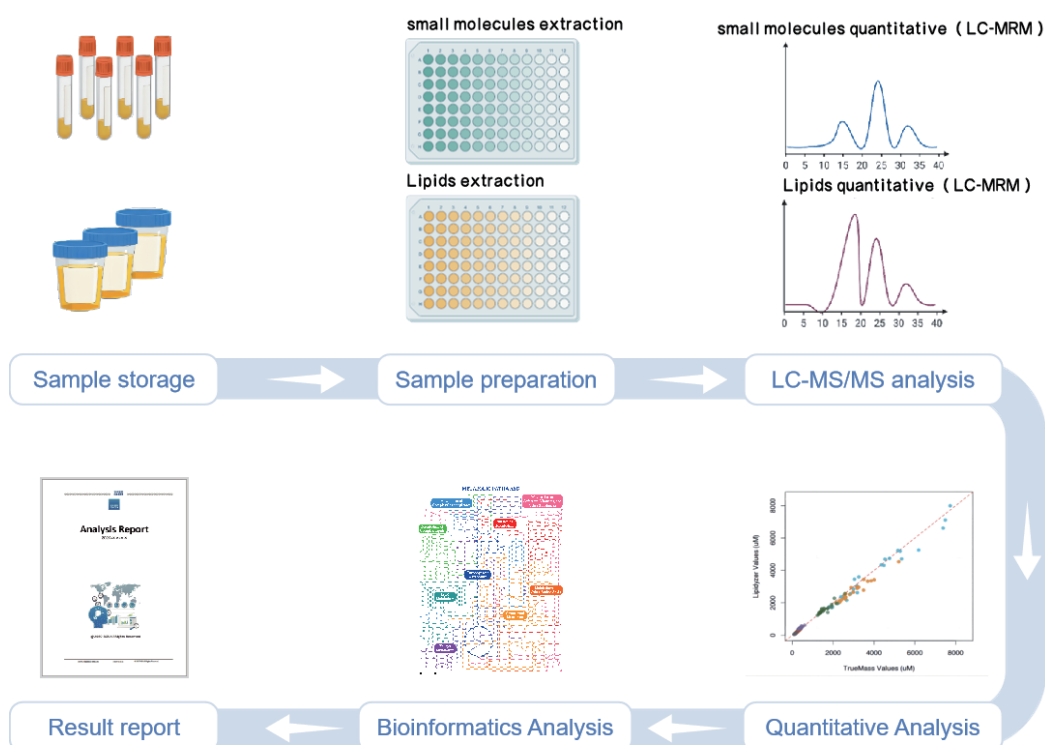
Metabolic Pathway	Related Metabolites	Function Application
Tryptophan metabolism	Tryptophan, Melatonin, Kynurenine, Indoleacetic acid, etc.	Gut - brain axis signaling, immune response, gut barrier, nervous system protection or toxicity, microbiota - host bridge, etc.
Tricarboxylic acid cycle	Pyruvic acid, Malic acid, Citric acid, Isocitric acid, Succinic acid, Fumaric acid, Oxoglutaric acid, Aconitic acid, etc.	Provide metabolic intermediates, body functions, affect cancer cell metastasis, etc.
Glycolysis / gluconeogenesis	Glucose 6-phosphate, Fructose 6-phosphate, Pyruvate, L-Lactic acid, Acetic acid, etc.	Provide metabolic intermediates, body function, tumor occurrence and development, metabolic diseases, etc.
Amino acid metabolism	L-Threonine, Glycine, Creatine, Sarcosine, Dimethylglycine, L-Leucine, L-Aspartic acid, L-Glutamine, L-Glutamic acid, etc.	Nutritional assessment, metabolic syndrome, immune regulation, cardiovascular disease progression, tumor suppression, etc.
Fatty acid synthesis	Lauric acid, Myristic acid, Stearic acid, Oleic acid, Caprylic acid etc.	Metabolic syndrome, cardiovascular disease, tumor immune regulation, gut health, etc.
Phosphopentose pathway	Pyruvic acid, D-Gluconolactone, Gluconic acid, Glyceric acid, Fructose 1,6-bisphosphate, etc.	Provide reducing power, prevent membrane lipid peroxidation, provide raw materials for substance synthesis, etc.
Glutathione metabolism	Ascorbic acid, Oxidized glutathione, Glycine, Dehydroascorbic acid, L-Glutamic acid, etc.	Resist oxidative stress, regulate cell apoptosis, and maintain immune system function
Nucleotide metabolism	Xanthosine, Hypoxanthine, Thymine, Adenosine monophosphate, etc.	Active intermediate metabolite, participate in coenzyme composition and signal transduction
Metabolism of cofactors and vitamins	L-Aspartic acid, Nicotinic acid, Gamma-Aminobutyric acid, Maleic acid, Quinolinic acid, etc.	Participate in body metabolism as a coenzyme, play a role in transferring electrons, atoms or chemical groups.
Nervous system function	L-Glutamine, L-Tyrosine, L-Dopa, Homovanillic acid, L-Tryptophan, 5-Hydroxy-L-tryptophan, etc.	GABAergic synapse, Dopaminergic synapse, Parkinson's disease, serotonergic synapse
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Research Applications



- Disease biomarkers research
- Pathogenesis and prognosis study on diseases
- Drug target research, toxicity assessment, drug efficacy evaluation, and target research
- Regulation mechanism of tissue development
- Microbial infection and its pathogenesis
- Animal particular behavior mechanism and food/medicinal value research
- Gut microbiota research

Analysis Workflow



Bioinformatics Analysis

Standard:

1. Data processing and quality control

Peak extraction, peak alignment, and metabolite identification Missing value filling, normalization, and low-quality data filtering BPC, CV, and PCA analysis of QC samples

2.Quantitative Analysis

The standard curve is drawn to calculate the concentration of metabolites

3.Statistical Analysis and Function Analysis

Global metabolite analysis (Chromatogram, super Pathway statistics, PCA for all samples, etc.)

Differential metabolites screening (PCA, PLS-DA, OPLS-DA, etc.)

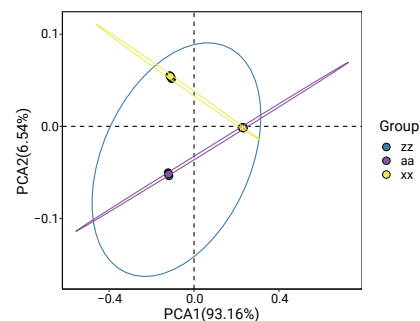
Analysis of differential metabolite in a single comparison group (Cluster heatmap, Z-score, etc.)

Differential metabolite analysis of all comparison groups (limited to two or more comparison groups).

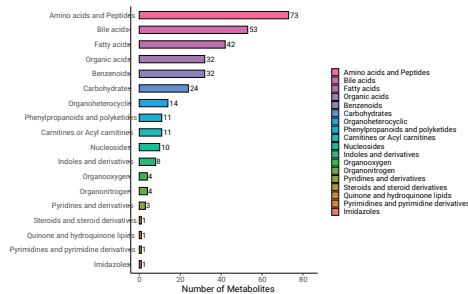
Customized:

- Metabolome + 16S/Metagenome correlation analysis
- Metabolome + Transcriptome/Proteome correlation analysis
- Metabolome + Genome re-sequencing correlation analysis (mGWAS)

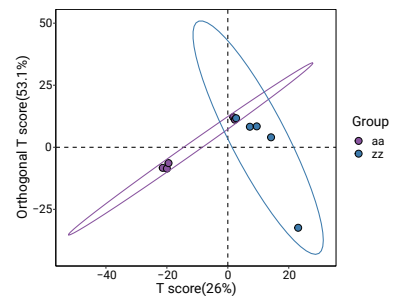
Examples of Bioinformatics Analysis



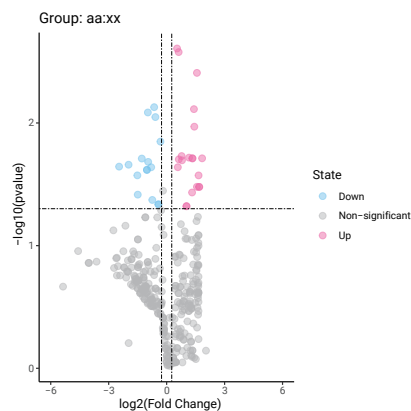
Score graph of PCA



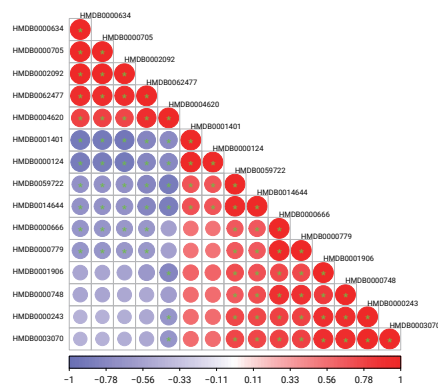
Metabolite classification bar chart



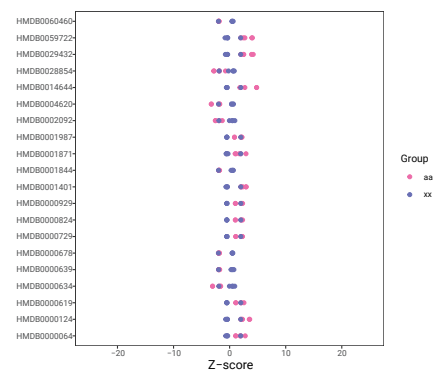
OPLS-DA score graph



Volcano plots of differential metabolites



Metabolite correlation heat map



Z-score

General Sample Requirements

Sample Type	Recommended Sample Amount	Minimum Sample Amount
Serum, plasma, urine	$\geq 200 \mu\text{L}$	$\geq 100 \mu\text{L}$
Animal and clinical tissues, feces and intestinal contents, microorganisms	$\geq 100 \text{ mg}$	$\geq 40 \text{ mg}$
Cell	2×10^7	2×10^5
Culture medium, fermentation medium	$\geq 1 \text{ mL}$	$\geq 200 \mu\text{L}$

Note: Cell samples need to be divided into two copies of the same

Biological Replicates Requirements

Sample Type	Recommended Biological Duplicates	Minimum Biological Duplicates
Cell and Microorganism	≥ 6	≥ 3
Animal	≥ 10	≥ 6
Human	≥ 30	≥ 10

Turn Around Time

Sample size: 1-50, 4-6 weeks

HM PRO2300 - HIGH-THROUGHPUT TARGETED METABOLOMICS PANEL



To learn more

If you have any questions or would like to discuss how our services can help you with your research, please don't hesitate to contact us at P_contact@innomics.com. We look forward to hearing from you!

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